

Appl. No. 10/709,278
Amdt. dated December 28, 2005
Reply to Office action of September 29, 2005

REMARKS/ARGUMENTS

1. The specification is amended to correct the informalities instructed by the examiner and the minor errors after checking. No new matter is entered.

5 2. *Claims 1, 3, 4, 8, 10, and 11 are objected to because of informalities.*

Response:

10 Claims 1, 3, 4, 8, 10, and 11 are amended to overcome the claim objections. No new matter is entered. Reconsideration of claims 1, 3, 4, 8, 10, and 11 is respectfully requested.

3. *Claims 8, 9, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Chung-Shi Liu (U.S. Patent No. 6,294,457).*

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Response:

20 The amended claim 8 recites a damascene process capable of avoiding via resist poisoning. The damascene process comprises providing a semiconductor substrate with a low-k dielectric layer thereon and a SiC layer over the low-k dielectric layer and forming a blocking layer on the SiC layer. The blocking layer is used to prevent unpolymerized precursors diffused out from the low-k dielectric layer from contacting an overlying resist. The damascene process further comprises forming a
25 BARC layer on the blocking layer, forming a resist layer having a via opening to expose a portion of the BARC layer on the BARC layer, and etching through the BARC layer, the blocking layer, the SiC layer, and a

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portion of the low-k dielectric layer to form a single damascene structure in the low-k dielectric layer.

According to column 1, line 51 to column 3, line 15 of Liu, a semiconductor substrate 10 on which a lower level metallization such as tungsten plug 12 in an insulating layer 14 overlying is provided. An etch stop layer 16, a low-k layer 18, a polish stop layer 20, and an additional layer 22 comprising silicon dioxide are successively formed on the substrate 10. The feature of Liu is the material used to form the additional layer 22 and the walls of the Ar sputter chamber is identical. When a pre-metal cleaning such as an Ar sputtering step is performed, the oxide will adhere well to the chamber walls of the same material and will not peel due to thermal stress causing particle contamination. Therefore the particle problem after pre-metal clean is avoided.

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Contrary to the additional layer 22 of Liu's teaching, the blocking layer of the present application is used to prevent unpolymerized precursors diffused out from the low-k dielectric layer from contacting an overlying resist. Applicant asserts that the blocking layer of the present application has different use and purpose from the additional layer 22 of Liu, and therefore the present application is patentably different from Liu. Reconsideration of claim 8 is politely requested.

Claim 9 recites the damascene process of claim 8 wherein the blocking layer is formed by Ar plasma hitting the SiC layer.

The examiner instructed that Liu has taught a blocking layer formed by Ar plasma hitting the SiC layer. Liu teaches the polish layer 20 comprising

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silicon dioxide, which has a specific use and purpose as describe above. According to column 3, lines 10-16, Liu teaches the material of the additional layer which is the same with that used in the Ar plasma sputter chamber, not instructs that the additional layer is formed by Ar
5 plasma sputtering or hitting. Applicant asserts that claim 9 is distinctly different from Liu. Therefore reconsideration of claim 9 is politely requested.

In addition, Claim 13 is dependent on claim 8 and should be allowed if
10 claim 8 is allowed. Reconsideration of claim 13 is therefore requested.

4. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chung-Shi Liu (U.S. Patent No. 6,294,457) in view of Chang et al. (U.S. Patent No.6,642,153).

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Response:

Claim 12 is dependent on claim 8 and should be allowed if claim 8 is allowed. Reconsideration of claim 12 is therefore requested.

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5. Allowable subject matter

Claims 1-7 would be allowed if amended to overcome the objection cited above.

*Claims 10 and 11 are objected to as being dependent upon a rejected base
25 claim, but would be allowable if rewritten in independent from including all of the limitations of the base claim and any intervening claims.*

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Claims 1-7 are amended to overcome the claim objection as the
examiner's instruction. Additionally, claims 10 and 11 are dependent on
claim 8 and should be allowed if claim 8 is allowed based on the above
5 reason. Reconsideration of claims 10 and 11 is therefore politely requested.

Applicant respectfully requests that a timely Notice of Allowance be
issued in this case.

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Sincerely yours,



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is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)